

REMARKS

The Official Action mailed December 19, 2003, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to April 19, 2003. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on March 16, 2000, June 14, 2000, October 19, 2000, January 31, 2001, October 31, 2001, February 28, 2002, June 13, 2002, and May 2, 2003. Although the Applicants have not received acknowledgment of the IDS filed on November 10, 2003, it appears that the Examiner has cited the sole reference from the IDS on Form PTO-892, i.e. U.S. Patent No. 6,400,428 to Izumi. Therefore, the IDS filed on November 10, 2003, has been effectively considered.

Claims 1-5, 16, 22-27, 40 and 46-74 are pending in the present application, of which claims 1-5 and 47-50 are independent. Independent claims 1-5 and 47-50 have been amended to better recite the features of the present invention, and dependent claim 46 has been amended to correct a minor grammatical error. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraphs 3-9 of the Official Action reject claims 1, 47, 51, 55, 59, 63, 67, 68, 71 and 72 as obvious based on the combination of U.S. Patent No. 5,536,950 to Liu et al., U.S. Patent No. 5,706,064 to Fukunaga et al. and U.S. Patent No. 6,400,428 to Izumi; claims 2, 22-27, 40, 48, 52, 56, 60 and 64 as obvious based on the combination of Liu, U.S. Patent No. 5,990,542 to Yamazaki, Fukunaga and Izumi; claims 3, 22-27, 40, 49, 53, 57, 61, 65, 69, 70, 73 and 74 as obvious based on the combination of U.S. Patent 6,081,305 to Sato et al., U.S. Patent 6,097,453 to Okita and Fukunaga; claims 4 and 50 as obvious based on the combination of Sato, Okita and Yamazaki; claims 54, 58, 62 and 66 as obvious based on the combination of Sato, Okita, Yamazaki and

Fukunaga; claims 5, 16, 22-27, 40 and 46 as obvious based on the combination of Liu, Fukunaga and Izumi; and claims 1, 2, 5, 22-27, 40, 47, 48, 51, 52, 55, 56, 59, 60, 63, 64, 67, 68, 71 and 72 as obvious based on the combination of Fukunaga, Liu and Izumi, respectively. The Applicants respectfully submit that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 1, 2, 5, 47 and 48 have been amended to recite a reflective pixel electrode having a flat upper surface thereon. Independent claims 3, 4, 49 and 50 have been amended to recite that a cross sectional shape of the contact hole is tapered, which is supported in the specification at page 10, second paragraph.

In a display device using a transparent pixel electrode, light is blocked by portions where transistors and metal wirings are provided, and the contact portion thereof generally does not function as a display. However, in a display using a reflective pixel electrode, the entire area of the pixel electrode functions as a display. Therefore, it is more important to improve a flatness of the pixel electrode over a contact hole in a display using a reflective pixel electrode than in a display using a transparent pixel electrode. The present invention recognizes the importance of these features for a reflective pixel electrode. Specifically, as noted above, independent claims 1, 2, 5, 47 and 48 have been amended to recite a reflective pixel electrode having a flat upper surface thereon, and this is more effective in a display using a reflective pixel electrode than in a display using a transparent pixel electrode. Also, independent claims 3, 4, 49 and 50 have been amended to recite that a cross sectional shape of the contact hole is tapered.

Liu, Fukunaga, Izumi, Yamazaki, Sato and Okita, either alone or in combination, do not teach or suggest at least the above-referenced features of the present invention. Regarding claims 1, 2, 5, 47 and 48, the Official Action asserts that Izumi teaches that it "would have been obvious to form Liu's pixel electrode [TM2] being either a transparent electrically conductive film or a reflective [electrically] conductive film depending upon the display device type which is desired for the liquid crystal display device" (page 3, Paper No. 1203, citing Izumi at column 6, lines 15-20). However, Liu and Izumi do not specifically teach or suggest a reflective pixel electrode having a flat upper surface thereon.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Liu, Fukunaga, Izumi, Yamazaki, Sato and Okita or to combine reference teachings to achieve the claimed invention.

The pixel electrode TM2 of Liu is not a reflective pixel electrode. The Official Action relies on Izumi to allegedly teach a reflective pixel electrode 15. As noted above,

the Official Action asserts that it “would have been obvious to form Liu’s pixel electrode [TM2] being either a transparent electrically conductive film or a reflective [electrically] conductive film depending upon the display device type which is desired for the liquid crystal display device” (page 3, Paper No. 1203, citing Izumi at column 6, lines 15-20). The Applicants respectfully disagree and traverse the assertion in the Official Action. Izumi merely teaches that “[e]ach pixel electrode 15 is ... a reflective electrically conductive film made of aluminum (Al) or the like when used for a reflecting type display device” (column 6, lines 17-19). The Liu device is not a reflecting type display device, and nothing in Liu, Izumi or the other prior art references of record teach or suggest converting a transmitting type display such as Liu into a reflecting type display. In other words, the Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art at the time of the invention to convert transmitting type pixel electrode TM2 of Liu into a reflecting type pixel electrode.

Even assuming motivation could be found, the Official Action has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable expectation of success when combining Liu, Fukunaga, Izumi, Yamazaki, Sato and Okita.

The Applicants further contend that even assuming, *arguendo*, that the combination of Liu, Fukunaga, Izumi, Yamazaki, Sato and Okita is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

Regarding claims 3, 4, 49 and 50, the Official Action asserts that via 80 of Liu corresponds with the contact hole of the present invention. However, the cross sectional shape of via 80 is not tapered and the prior art does not teach or suggest changing the cross sectional shape of via 80. Fukunaga, Yamazaki, Sato and Okita do

not cure the deficiencies in Liu and Izumi and do not teach or suggest all the features of the present invention.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,



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